

ASHLEIGH L. WARD

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SKILLS SUMMARY

Critical Thinking: Adept at problem solving and detail oriented experimentation. Independently developed successful research projects, all resulting in peer-reviewed publications. Demonstrated mastery of a broad range of analytical research techniques, as well as accompanying data collection, subsequent analysis, and professional presentation of results.

Communication: Excellent written, oral and visual presentation skills. Able to convey complex research topics to scientific and general audiences, leading to the acquisition of fellowships and grants, publication of articles, and presentation awards.

Leadership: Strong interpersonal and management skills. Point person for several research projects, entailing mentorship of both graduate and undergraduate students and project development. Active role as lab manager, requiring the ability to multitask, delegate, and effectively communicate both positive reinforcement and constructive criticism with others.

EDUCATION

University of California, Berkeley, Berkeley, CA 2009 – 2014
Ph.D. Chemistry
Research Advisor: Professor John Arnold

George Washington University, Washington, DC 2004 – 2008
B.S. Chemistry, *magna cum laude*, Special Honors in Chemistry
Research Advisor: Professor Michael Wagner

RESEARCH EXPERIENCE

Lawrence Berkeley National Laboratory, Berkeley, CA, *Postdoctoral Fellow* 2014 – Present
Materials for lithium-sulfur hybrid flow batteries: Designed, synthesized and assessed structure/function relationships of a library of polymers employed as tunable lithium-ion transport membranes. Carried out electrochemical testing on this new class of single ion conducting membranes for Li-ion battery applications. Participated in broad collaborative efforts aimed at improving grid energy storage capabilities as part of the Joint Center for Energy Storage Research (JCESR).

University of California, Berkeley, CA, *Graduate Student Researcher* 2009 – 2014
Actinide metal-metal bonding: Independently developed a project on uranium and thorium systems containing secondary coordination spheres for the study of M-M bonding and reactivity, resulting in a rare U-Co bond and novel Th-Co bond.
Thorium(IV) and Uranium(IV) corroles: Created a remarkably high yielding synthetic route to the first actinide corroles. Carried out detailed characterization both in solid and solution state, followed by in depth reactivity studies.
Nonprecious metal catalysts for fuel cells: Synthesized a series of first row transition metal complexes, displaying excellent four-electron reduction selectivity at low onset potentials, as inexpensive and efficient catalysts for fuel cell technologies.

The National Institute of Health, Bethesda, MD, *Postbaccalaureate Fellow* 2008 – 2009
Antibody production, purification and utilization: Identified cell surface markers or signaling proteins for a specific type and stage of cancer cell for prognostic, diagnostic and treatment purposes.

George Washington University, Washington, DC, *Undergraduate Researcher* 2006 – 2008
Nano materials for lithium-ion batteries: Inexpensive nano materials were synthesized, characterized and tested in lithium-ion batteries, showing improvements in rate capacity and low temperature performance.

SCIENCE COMMUNICATION & OUTREACH

Environmental Health & Safety (EH&S) Officer, UC Berkeley, *Liaison* 2009 – 2014
Facilitated EH&S program development, training and inspections. Demonstrated knowledge of EH&S regulations, codes and standards. Oversaw lab procedures and ensured compliance with State and Federal regulations.

California Energy Commission (CEC), Sacramento, CA, *Consultant* Fall 2013
Collaborated with startups, consultants, venture capitalists, MBAs and other PhDs to advise the CEC on the scientific merit of renewable energy projects as part of the Berkeley Energy & Resources Collaborative Innovation Solutions program.

Bay Area Scientists in Schools (BASIS), *Volunteer* 2009 – Present
Participated in specially designed lesson plans and experiments at local elementary schools to employ hands on learning experiences to facilitate youth science participation and excitement.

TEACHING & LEADERSHIP EXPERIENCE

University of California, Berkeley, CA

Graduate Student Instructor, General and Organic Chemistry Fall 2009, 2010, 2011, 2014

Led chemistry laboratory sections of 30 undergraduate students. Lectured on lab related class topics, hosted group discussion, and supervised laboratory exercises. Graded problem sets, laboratory reports, quizzes and exams and held review sessions.

Undergraduate Mentoring 2009 – 2011

Mentored an undergraduate student in advanced synthetic laboratory techniques and theory. Developed independent research projects and guided experimental design and execution.

George Washington University, Washington, DC

Undergraduate Mentor/Tutor 2006 – 2008

Mentored fellow chemistry majors and tutored students in General, Organic and Physical chemistry as a volunteer through Alpha Chi Sigma.

AWARDS & HONORS

University of California Dissertation Year Fellowship, University of California, Berkeley (2013)

Best Poster Presentation (4 awarded), Berkeley Energy and Resources Collaborative (BERC) Energy Symposium (2011)

National Science Foundation Graduate Research Fellowship (2010)

Abramson Graduate Scholarship in Chemistry, University of California, Berkeley (2010)

Cancer Research Training Award, The National Cancer Institute, The National Institute of Health, (2008)

William E. Fitch Prize in Chemistry, George Washington University (2008)

Byrne Thurtell Burns Memorial Prize in Chemistry, George Washington University (2008)

American Chemical Society Award for Undergraduate Excellence (2007)

George Washington Fellowship for Excellence in Nanoscience, George Washington University (2007)

American Chemical Society Prize in Analytical Chemistry (2007)

TECHNICAL CAPABILITIES

- Inorganic, organometallic and organic synthesis, including Schlenk-line and glove-box techniques for the handling of highly air and water sensitive materials.
- Polymer synthesis, purification and subsequent materials processing.
- Safe handling of pyrophoric materials both in solution and solid state.
- Radioactive material acquisition, safe handling and transfer.
- Single-crystal X-ray diffraction, data acquisition and analysis.
- ^1H and multinuclear NMR spectroscopy, including variable temperature techniques.
- Electrochemical techniques, including cyclic voltammetry, rotating ring and rotating disk voltammetry, and controlled potential coulometry.
- Battery design, construction and performance assessment for new materials.
- Additional analytical techniques include mass spectrometry, UV-vis/NIR, fluorescence and IR spectroscopy, magnetic susceptibility and conductance measurements.

PUBLICATIONS

Ward, A. L., Lukens, W. W., Arnold, J. "Photochemical Route of Actinide-Transition Metal Bonds: Synthesis and Characterization of a Series of Uranium and Thorium Heterobimetallics." *J. Am. Chem. Soc.*, **2014**, *136*, 3647.

Padilla, R., Buckley, H. L., Ward, A. L., Arnold, J. "Group 4 Corroles: Synthesis, Characterization and Reactivity of a Series of Mononuclear Corrole Halides." *Chem. Comm.*, **2014**, *50*, 2922.

Padilla, R., Buckley, H. L., Ward, A. L., Arnold, J. "Preparation and Characterization of a Tungsten(V) Corrole Dichloride Complex." *J. Porphyrins Phthalocyanines*, **2014**, *18*, 1.

Ward, A. L., Buckley, H. L., Lukens, W. W., Arnold, J. "Synthesis and Characterization of Thorium(IV) and Uranium(IV) Corrole Complexes." *J. Am. Chem. Soc.*, **2013**, *135*, 13965.

Ward, A. L., Elbaz, L., Kerr, J. B., Arnold, J. "Nonprecious Metal Catalysts for Fuel Cell Applications: Electrochemical Dioxygen Activation by a Series of First Row Transition Metal Tris(2-pyridylmethyl)amine Complexes." *Inorg. Chem.*, **2012**, *51*, 4694.

PRESENTATIONS

“Photochemical Route to Actinide-Transition Metal Bonds: Synthesis, Characterization and Reactivity of a Series of Thorium and Uranium Heterobimetallics.” Ward, A. L., Lukens, W. W., Lu, C. C., Arnold, J. Symposium in Honor of Norman Edelstein at the 247th American Chemical Society National Meeting. Dallas, TX, March 2014.

“Photochemical Preparation of Actinide-Transition Metal Bonds: Synthesis, Characterization and Reactivity of a Series of Thorium and Uranium Heterobimetallics.” Ward, A. L., Lukens, W. W., Arnold, J. Royal Australian Chemical Institute. University of Queensland, Brisbane, Australia, December 2013.

“Actinide Systems for the Study of Bonding and Reactivity.” Ward, A. L., Lukens, W. W., Arnold, J. Glen T. Seaborg Center Seminar. Lawrence Berkeley National Laboratory, Berkeley, CA, August 2013.

“Nonprecious Metal Catalysts for Fuel Cell Applications: Electrochemical Dioxygen Activation by a Series of First Row Transition Metal Tris(2-pyridylmethyl)amine Complexes.” Ward, A. L., Elbaz, L., Kerr, J. B., Arnold, J. Berkeley Center for Green Chemistry 2nd Annual Conference in Green Chemistry. Berkeley, CA, May 2012.

“Nonprecious Metal Catalysts for Fuel Cell Applications: Electrochemical Dioxygen Activation by First Row Polypyridyl Complexes.” Ward, A. L., Elbaz, L., Kerr, J. B., Arnold, J. 11th International Symposium on Bio-Environmental Chemistry. Global Education and Research Center for Bio-Environmental Chemistry, Osaka University, Osaka, Japan, December 2011.

“Making Fuel Cells a Viable Alternative Energy Solution: Nonprecious Metal Catalysts for Oxygen Reduction.” Ward, A. L., Elbaz, L., Kerr, J. B., Arnold, J. Berkeley Energy and Resources Collaborative (BERC) Energy Symposium. Berkeley, CA, October 2011.

“First Row Tris(pyridyl)amine Complexes as Novel Cathode Catalysts for PEM Fuel Cells.” Ward, A. L., Kerr, J. B., Arnold, J. UC Berkeley Graduate Research Seminar Series, University of California, Berkeley, CA February 2011.